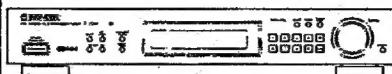




# Service Manual



ORDER NO.  
ARP2891

## FM/AM DIGITAL-SYNTHESIZER TUNER **F-204RDS**

**THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).**

Type	Model	Power Requirement	The voltage can be converted by the following method.
	F-204RDS		
HEXK	○	AC 220-230V	AC240V, *
HBWXK	○	AC230V	AC240V, *
HEWZXK	○	AC220-230V	AC240V, *
HEWIXK	○	AC220-230V	AC240V, *

\* : Alter the wiring of the Power-supply block at the primary winding of Power-transformer referring to the "Line Voltage Selection" described in Service Manual.

●For HBWXK, HEWZXK and HEWIXK types, refer to page 27.

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# 1. EXPLODED VIEWS, PACKING AND PARTS LIST

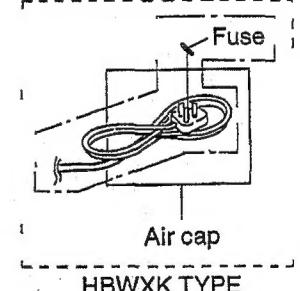
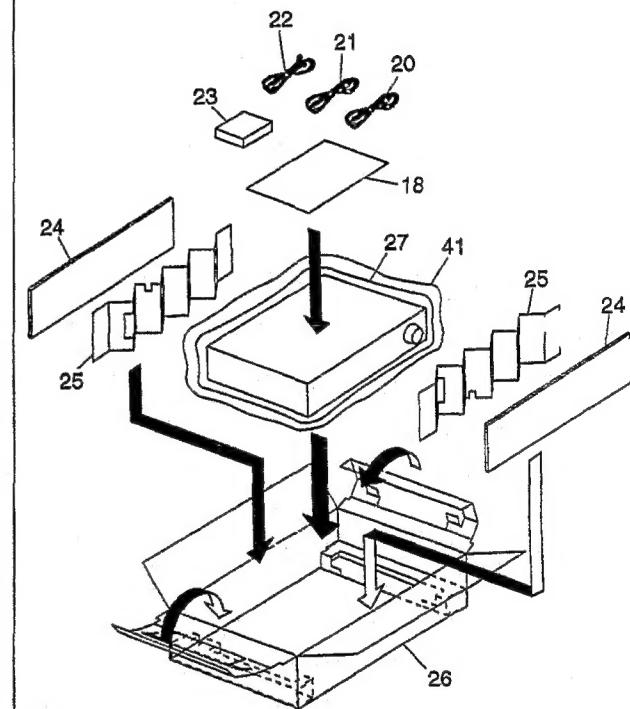
**NOTES:**

- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The  $\Delta$  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

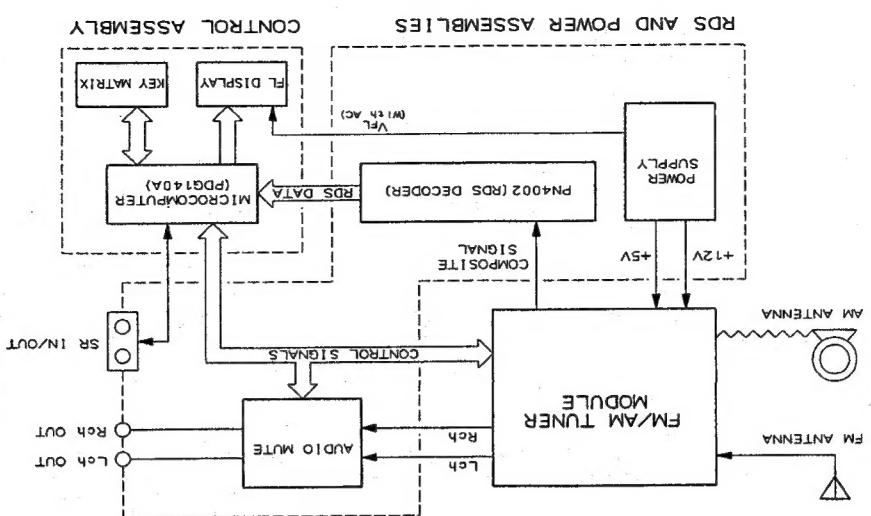
## PARTS LIST (for F-204RDS/HEXK)

Mark	No.	Description	Parts No.
	1	FRONT PANEL (PLS)	AMB7241
	2	CONTROL ASS'Y	AWZ7714
	3	C1 CERAMIC CAPACITOR	CCDSL221J50
$\Delta$	4	AC POWER CORD	ADG1138
	5	CHASSIS (MET)	ANA1478
$\Delta$	6	INSULATOR	PNW1912
NSP	7	STRAIN RELIEF	AEC-882
	8	PCB MOULD	AMR1525
	9	SCREW	ABA-298
	10	SCREW	ABA1018
	11	SCREW	BPZ26P080FMC
	12	FL PANEL (PLS)	AAK7132
	13	NAME PLATE	PAM1608
	14	POWER BUTTON (ABS)	AAD2425
	15	C2 CERAMIC CAPACITOR	CKDYZ102K50
	16	NUT	NK70FUC
	17	BONNET(FE)	ANE7058
	18	OPERATING INSTRUCTIONS (English/French/German/Italian/ Swedish/Dutch/Spanish/Portuguese)	ARE7031
NSP	19	PCB MOULD	AMR2115
	20	CORD WITH PLUG	PDE1249
	21	CORD WITH PLUG	PDE1095
	22	FM ANTENNA	ADH7001
	23	LOOP ANTENNA	ATB7001
	24	SPACER (PAP)	AHA7058
	25	SPACER (PAP)	AHA7074
	26	PACKING CASE	AHD7133
	27	PACKAGING SHEET	AHG1107
	28	RDS ASS'Y	AWZ7711
NSP	29	POWER ASS'Y	AWZ7709
	30	FM/AM TUNER MODULE	AXQ7040
	31	BINDER	AEP-215
NSP	32	BARRIER	AEC1416
	33	SCREW (STEEL)	ABA1006
	34	SCREW (STEEL)	ABA1011
	35	SCREW	ABA1024
	36	SCREW (STEEL)	ABA1047
	37	ROTARY KNOB M (PLS)	AAB7049
	38	HINGE BUTTON A (PLS)	AAD7162
	39	HINGE BUTTON B (PLS)	AAD7164
	40	HINGE BUTTON C (PLS)	AAD7166
NSP	41	VINYL SHEET	AHG7013

### ● PACKING

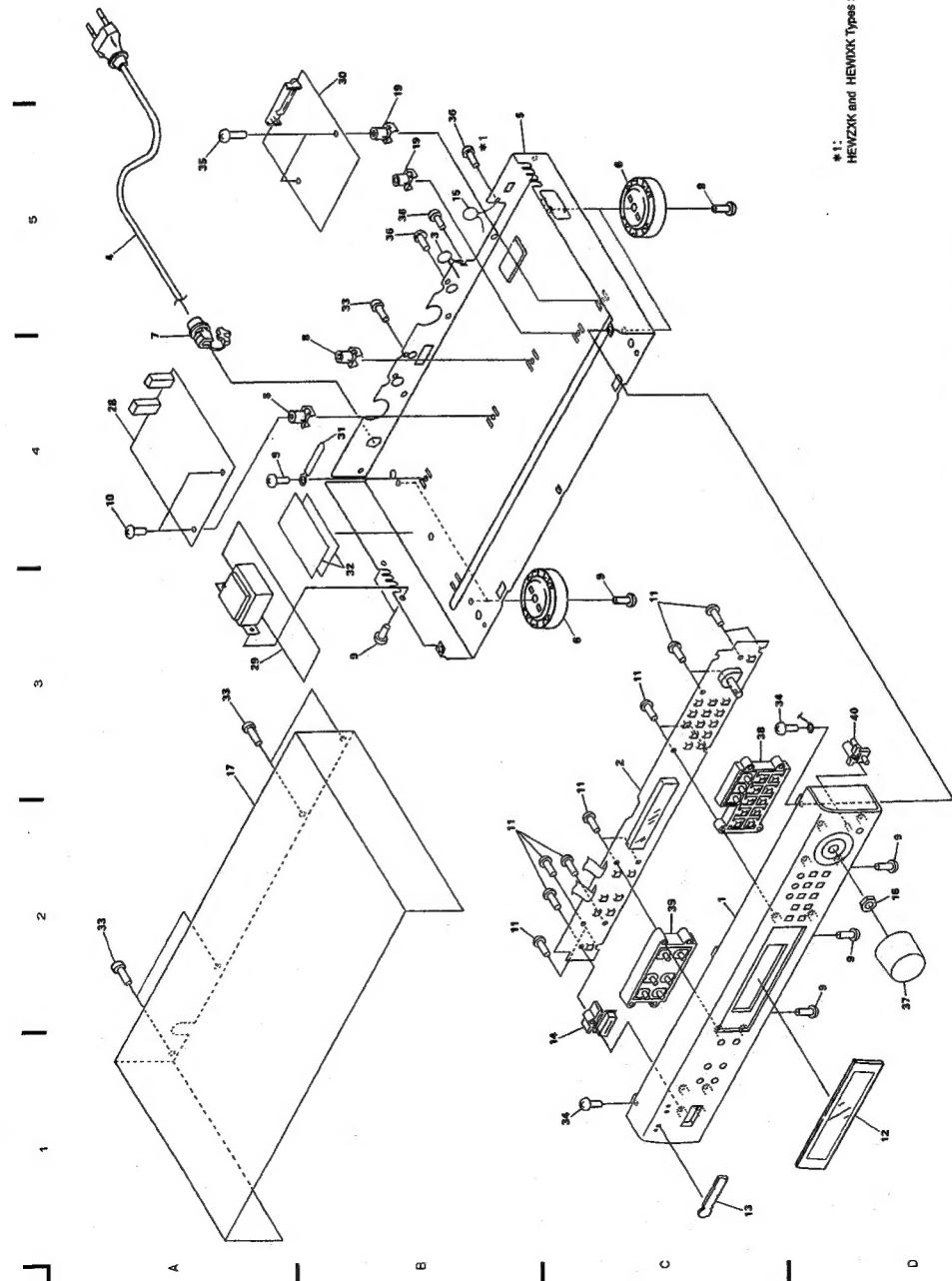


## 2. BLOCK DIAGRAM



\*1: HEW2K and HEWKK Types : ABA1006

NOTE: Screws adjacent to ▼ mark on product are used for disassembly.



### 3. SCHEMATIC AND PCB CONNECTION DIAGRAMS

#### NOTE FOR SCHEMATIC DIAGRAMS (Type 3A)

- A 1. When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".

2. Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.

3. RESISTORS:  
Unit: kΩ, M:ΜΩ, or Ω unless otherwise noted.  
Rated power: 1/4W, 1/6W, 1/8W, 1/10W unless otherwise noted.  
Tolerance: (F): ±1%, (G): ±2%, (K): ±10%, (M): ±20% or ±5% unless otherwise noted.

4. CAPACITORS:  
Unit: pF or μF unless otherwise noted.  
Rating: capacitor (μF) voltage (V) unless otherwise noted.  
Rated voltage: 50V except for electrolytic capacitors.

5. COILS:  
Unit: mH or μH unless otherwise noted.

- B 6. VOLTAGE AND CURRENT:  
mV : Signal voltage at FM 1kHz, 100% MOD.  
or → V : DC voltage (V) at no input signal unless otherwise noted.  
Value in ( ) is DC voltage at rated power.  
mA or → mA : DC current at no input signal unless otherwise noted.

7. OTHERS:  
• ◎ or ◇ : Adjusting point.  
• ← : Measurement point.  
• The Δ mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.

8. SCH-□ ON THE SCHEMATIC DIAGRAM:  
• SCH-□ indicates the drawing number of the schematic diagram. (SCH stands for schematic diagram.)

- C 9. SWITCHES (Underline indicates switch position):  
CONTROL ASSY  
S401 : POWER(STANDBY/ON) S414 : 1  
S402 : AM S415 : 6  
S403 : FM S416 : 7  
S404 : DISPLAY MODE S417 : 8  
S405 : CHARACTER/SEARCH S418 : 9  
S406 : MPX MODE(AUTO/MONO) S419 : 0/10  
S407 : MEMORY S420 : DIRECT  
S410 : 5 S421 : CLASS  
S411 : 4 S422 : RF ATT  
S412 : 3 S423 : TUNING  
S413 : 2 S424 : TUNING MODE

#### NOTE FOR PCB DIAGRAMS:

1. Part numbers in PCB diagrams match those in the schematic diagrams.  
2. A comparison between the main parts of PCB and schematic diagrams is shown below.

Symbol in PCB Diagrams	Symbol in Schematic Diagrams	Part Name
Q504 E O504	Q504 Q504	Transistor
D203 D203	D203	Diode
C513 C513	C513	Capacitor (Polarized)

3. The transistor terminal marked with E or E shows the emitter.  
4. The diode terminal marked with @ or C shows cathode side.  
5. The capacitor terminal marked with @ or L shows negative terminal.

6. The parts mounted on each PCB include all necessary parts for several destinations. For further information for respective destinations, be sure to check with the schematic diagram.

#### 3.1 RDS, POWER AND CONTROL ASSEMBLIES

##### Line Voltage Selection

Line Voltage can be changed by the following modification:

1. Disconnect the AC power cord.

2. Remove the cover.

3. Change the position of the jumper-lines as follows.

Voltage	Jumper-line position
220V-230V	①
240V	②

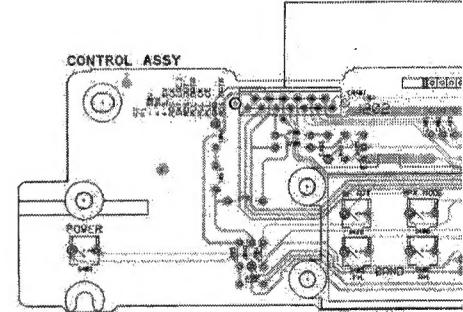
NOTE: When replacing a PCB which has the primary winding circuit of Power-transformer, be sure to compare its circuit with the diagram in Service Manual.

Jumper-lines on the PCB may have to be removed.

Forgetting this check-up will cause a serious damage.

4. Stick a line voltage label on the rear panel.

Part No.	Description
AAX-193	220V label
AAX-192	240V label



Q401

5

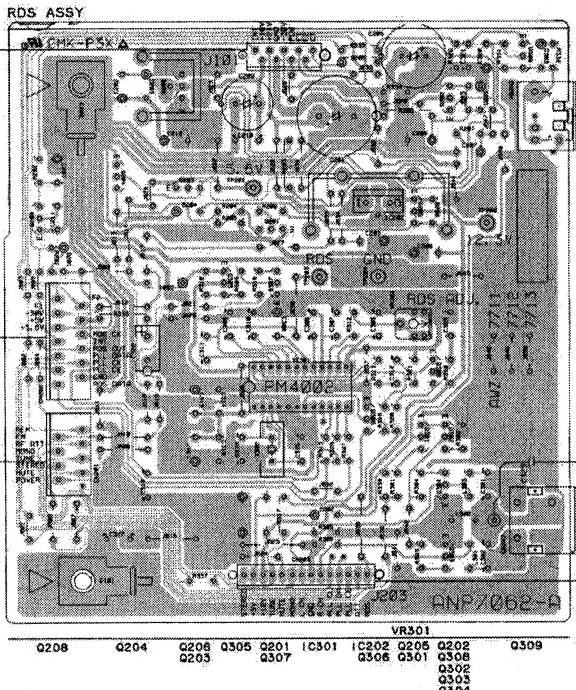
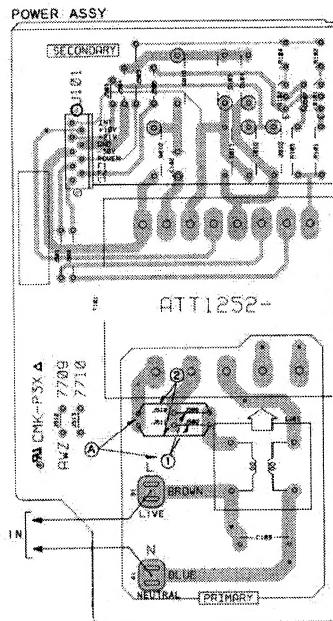
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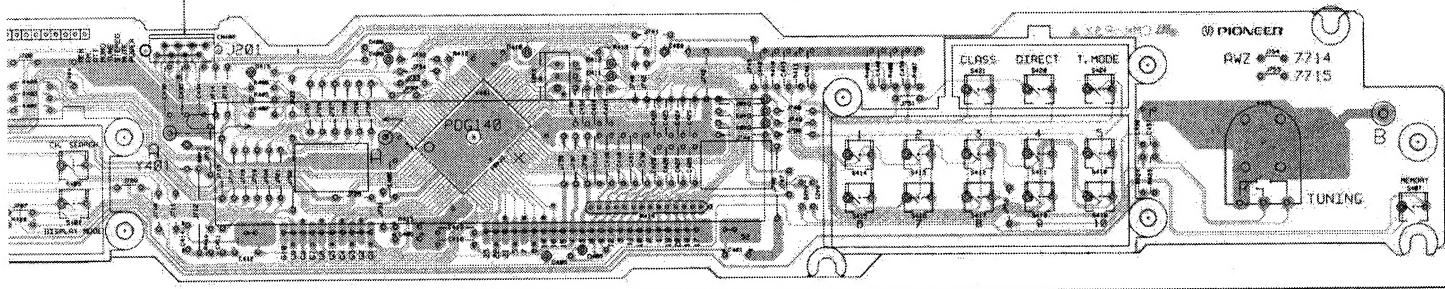
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5

- This diagram is viewed from the mounted parts side.



4



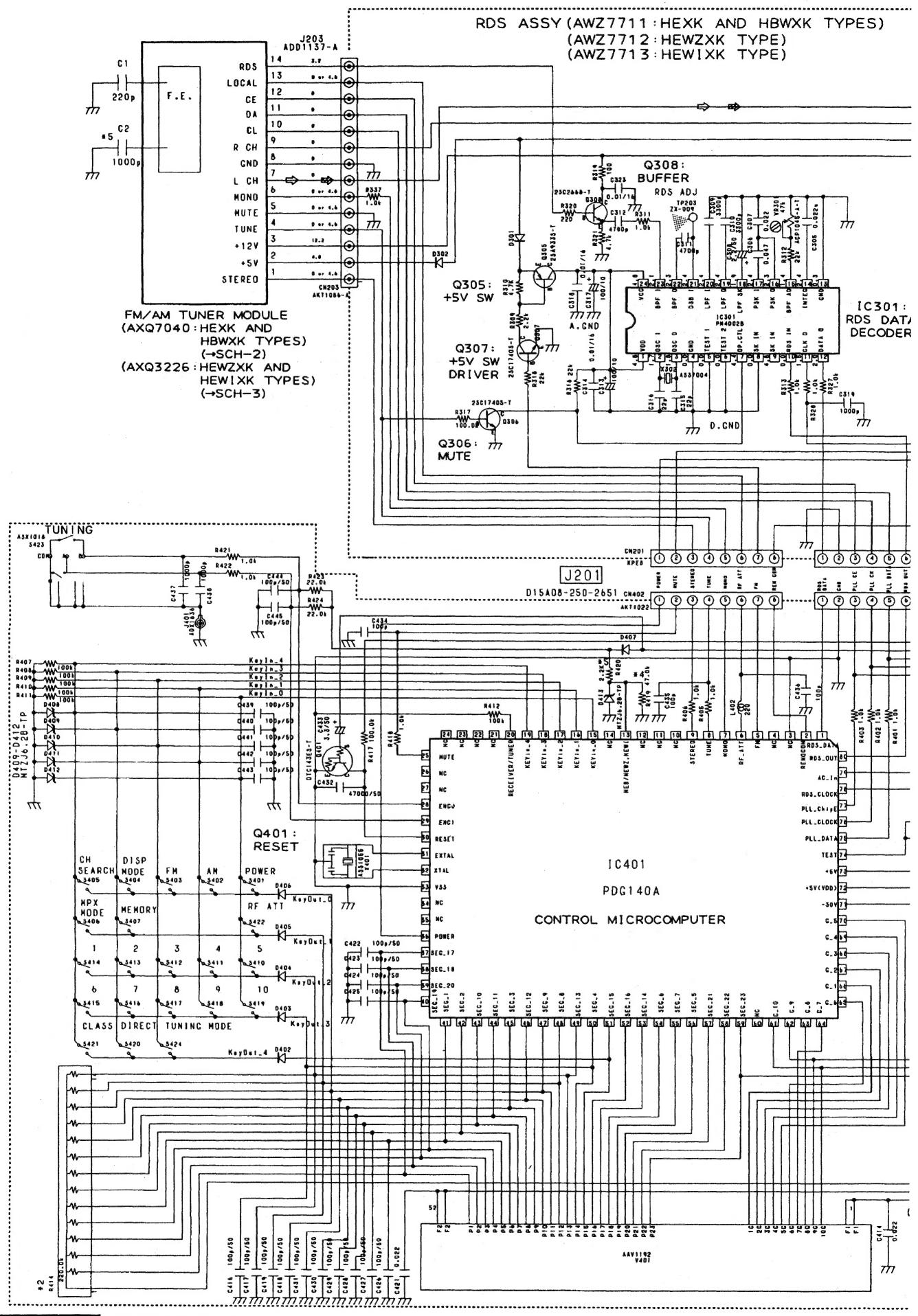
1C401

5

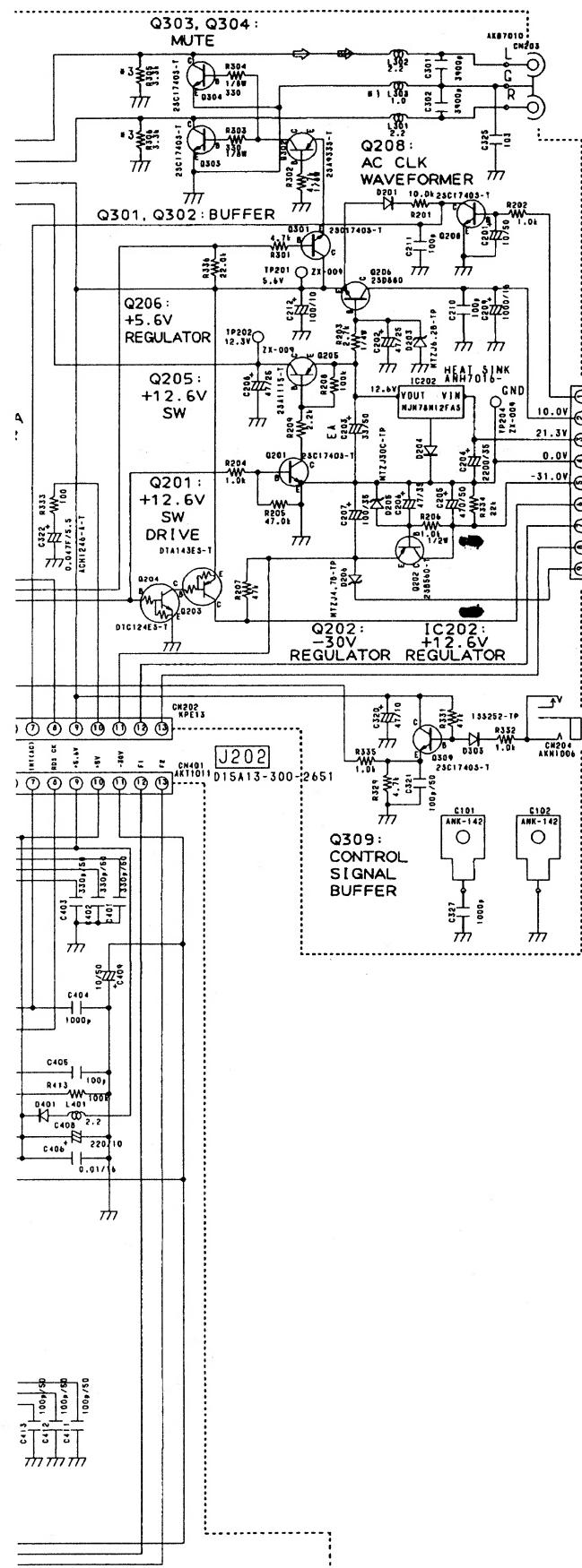
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1

9



## RDS ASSY, POWER ASSY,

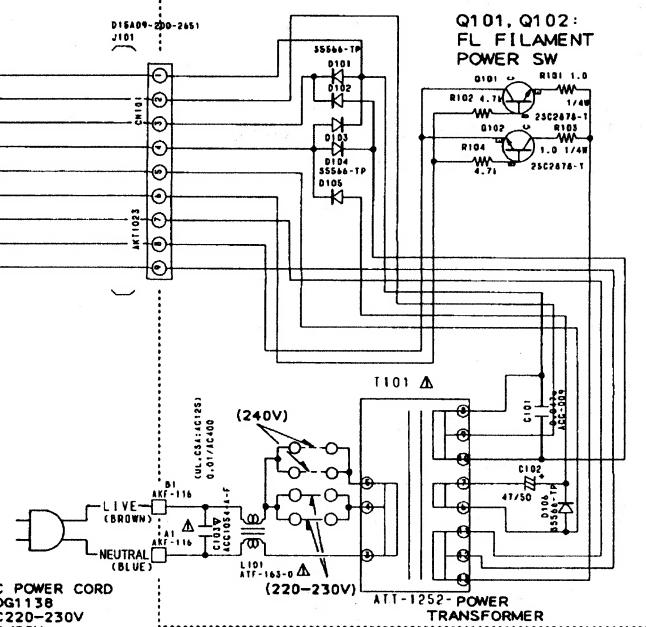


⇒ FM Signal route  
⇒ AM Signal route

SCH-1

A

POWER ASSY  
(AWZ7709: HEXX AND HBWXK TYPES)  
(AWZ7710: HEWZXK AND HEWIXK TYPES)



- \*1 HEWZXK, HEWIXK USE 2.2uH
- \*2 USE ONETIME\_MICROPROCESSOR ONLY
- \*3 HEXX, HBWXK, HEWIXK ONLY USE
- \*4 HEWZXK, HEWIXK use 100kohm
- \*5 HEXX, HBWXK ONLY USE

Δ

## Noted

## 1. Resistors

Indicated in ohm 1/8W - 5%  
tolerance  
unless otherwise noted  
K=kohm, M=Mohm

## 2. Capacitors

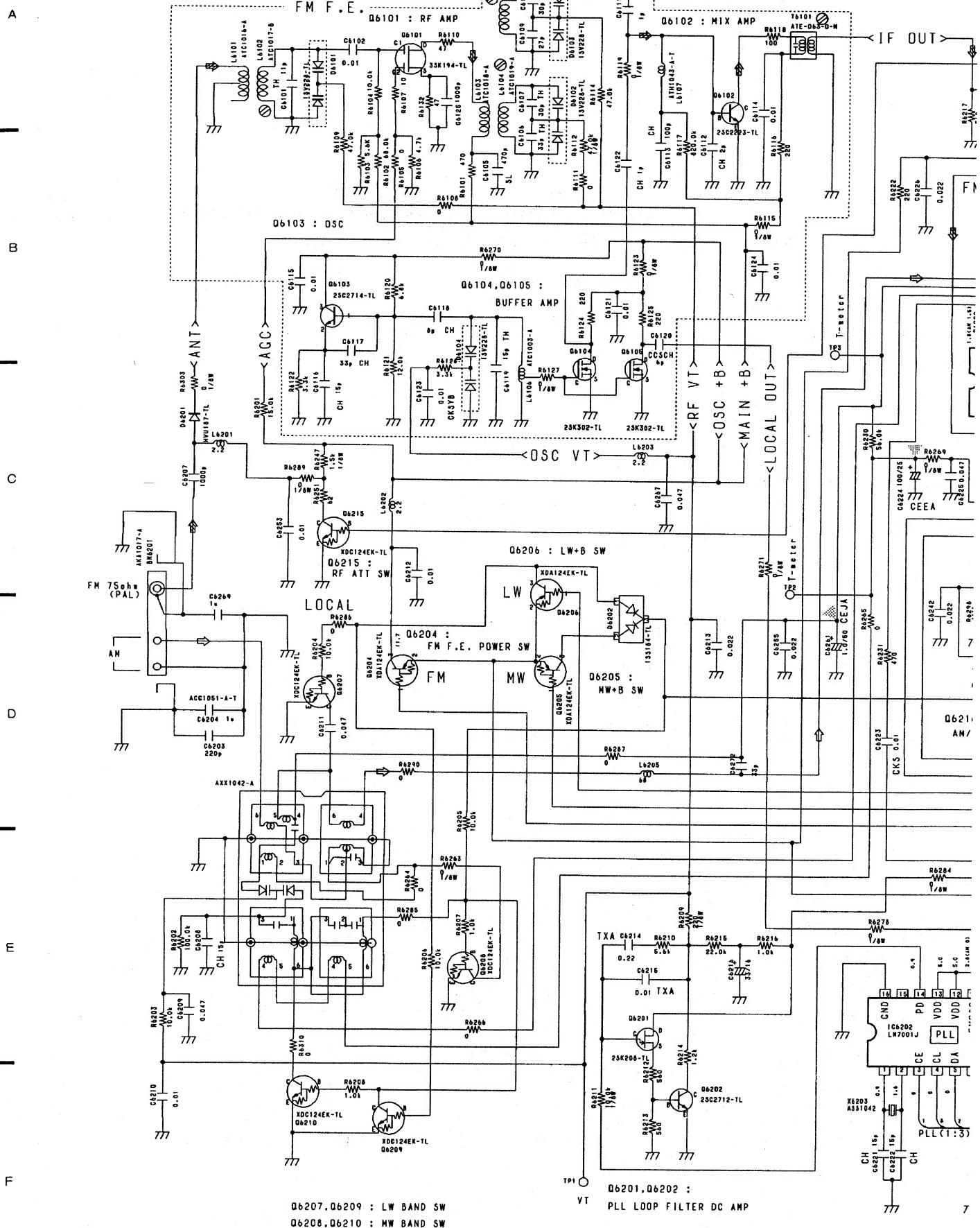
Indicated in  
capacity(uF)/voltage(v)  
unless otherwise noted  
Indication without voltage is 50V  
except electrolytic capacitor.

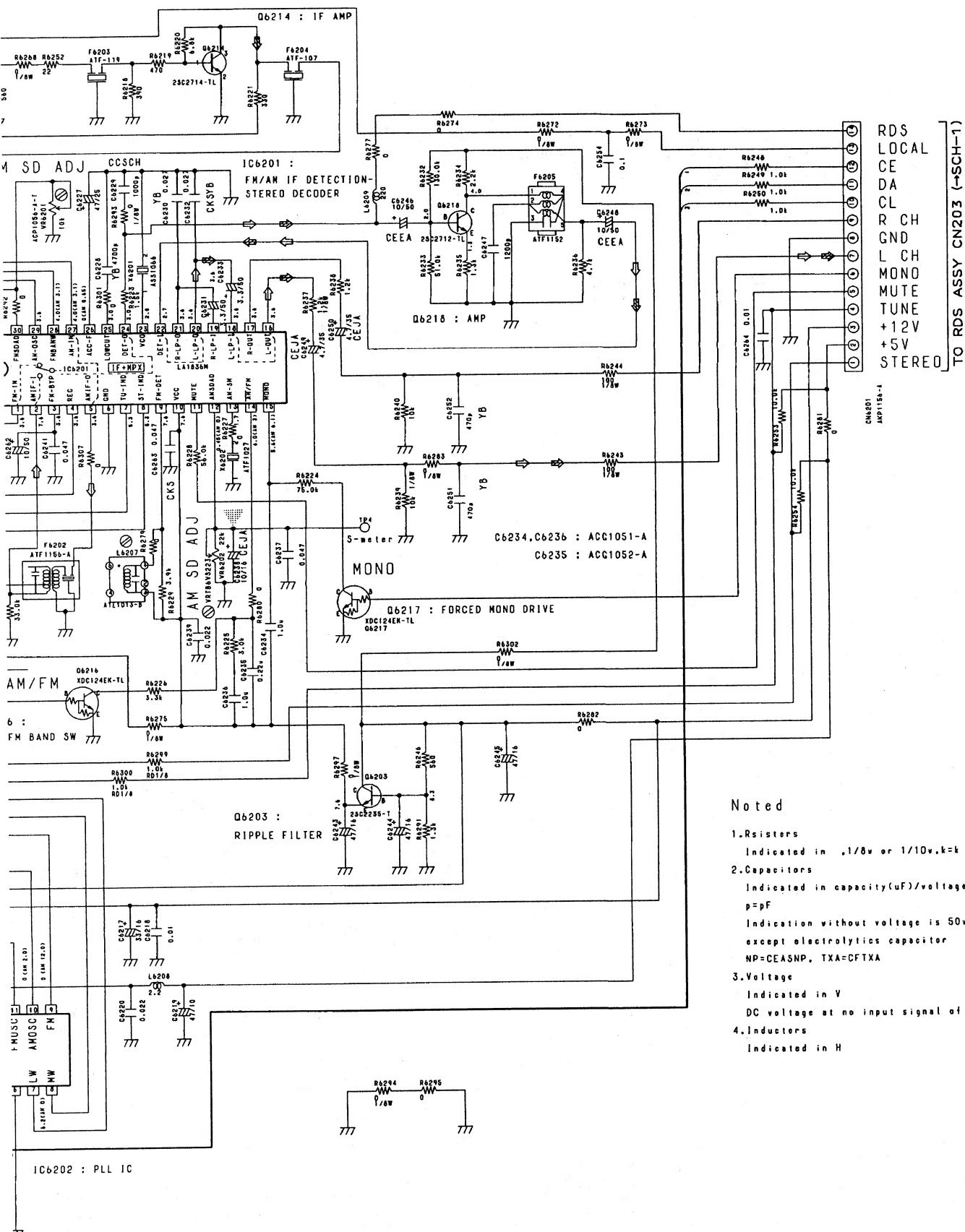
D

E

F

## FM/AM TUNER MODULE (AXQ7040 : HEXK AND HBWXK TYPES)





#### Noted

1. Resistors  
Indicated in  $\mu\text{A}$  or  $1/10\text{W}, k=\text{k}$
2. Capacitors  
Indicated in capacity ( $\mu\text{F}$ ) / voltage (V)  
 $\mu=\text{pF}$   
Indication without voltage is 50V  
except electrolytics capacitor  
NP=CEASNP, TXA=CFTXA
3. Voltage  
Indicated in V  
DC voltage at no input signal of FM
4. Inductors  
Indicated in H

## 3.3 FM/AM TUNER MODULE (FOR HEWZXK AND HEWIXX TYPES)

- This diagram is viewed from the mounted parts side.

PCB-3

FM/AM TUNER MODULE (HEWIXX AND HEWZXK TYPES)

A

A

B

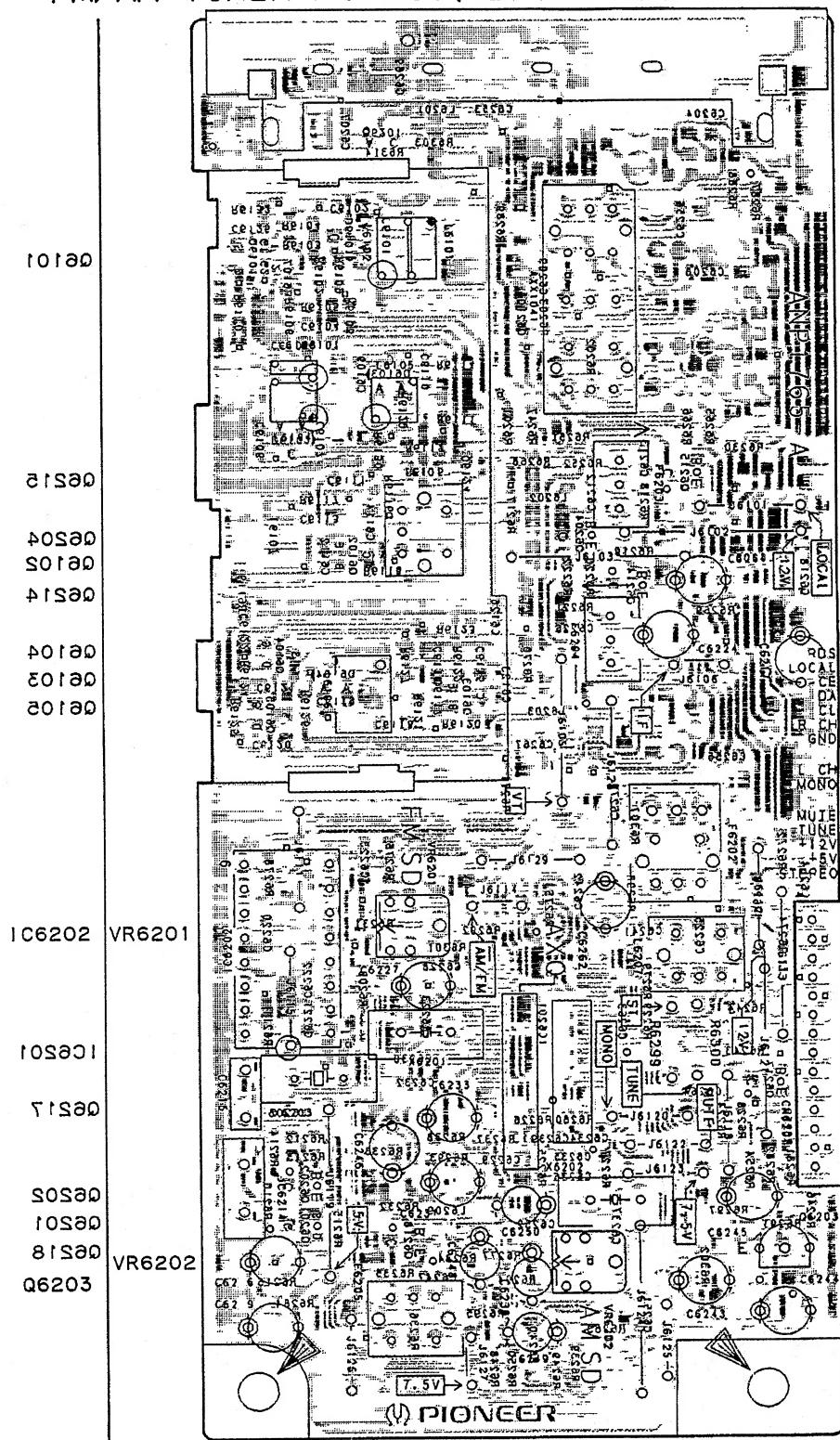
B

C

C

D

D



● This diagram is viewed from the mounted parts side.

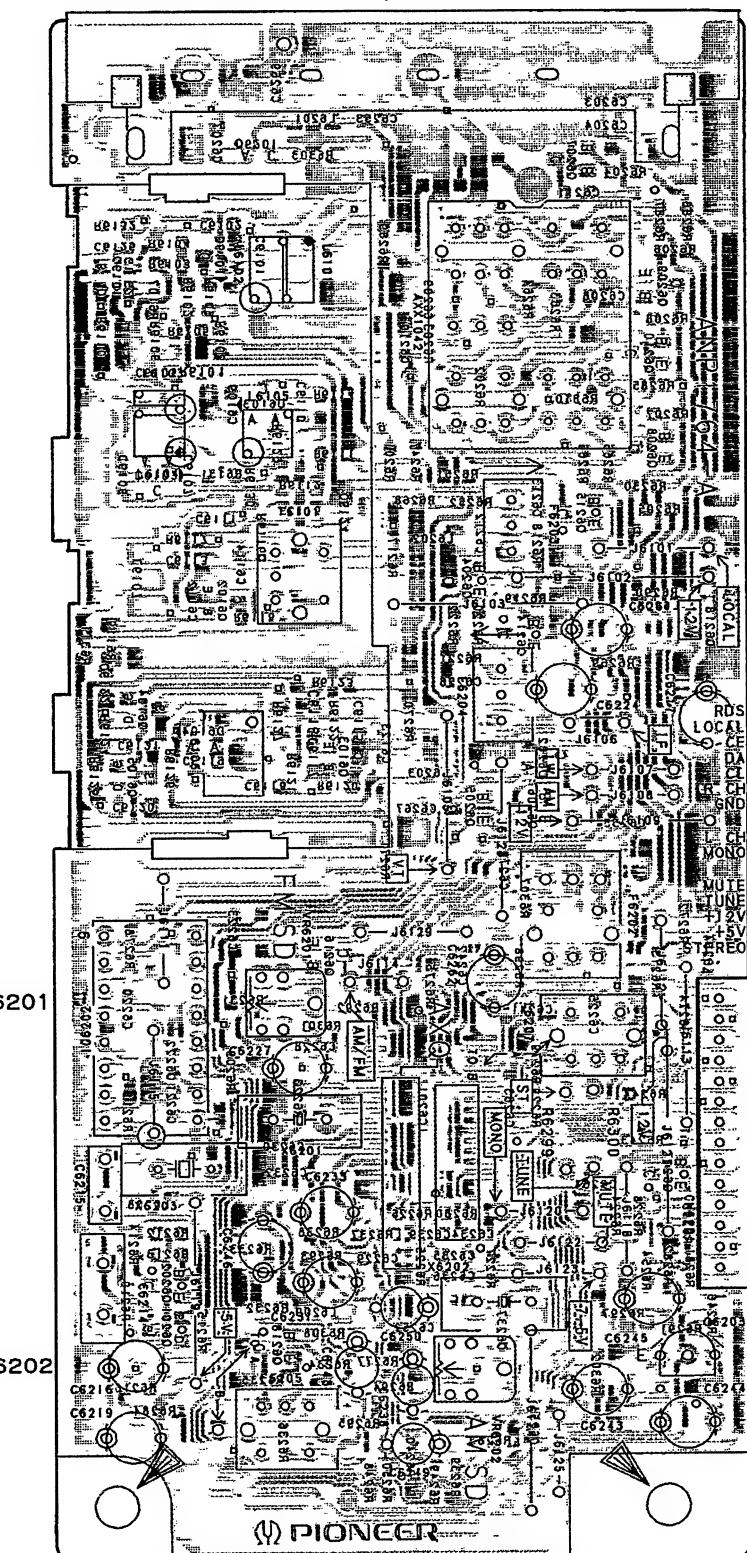
PCB-2

### FM/AM TUNER MODULE (HEXK AND HBWXK TYPES)

A

A

66202  
66201  
66200  
66210  
66208  
66215  
66103 66204  
66214  
66104  
66102 66103  
66205 66206  
66216  
IC6202 VR6201  
IC6201  
66213  
66205  
66201  
66218  
Q6203 VR6202



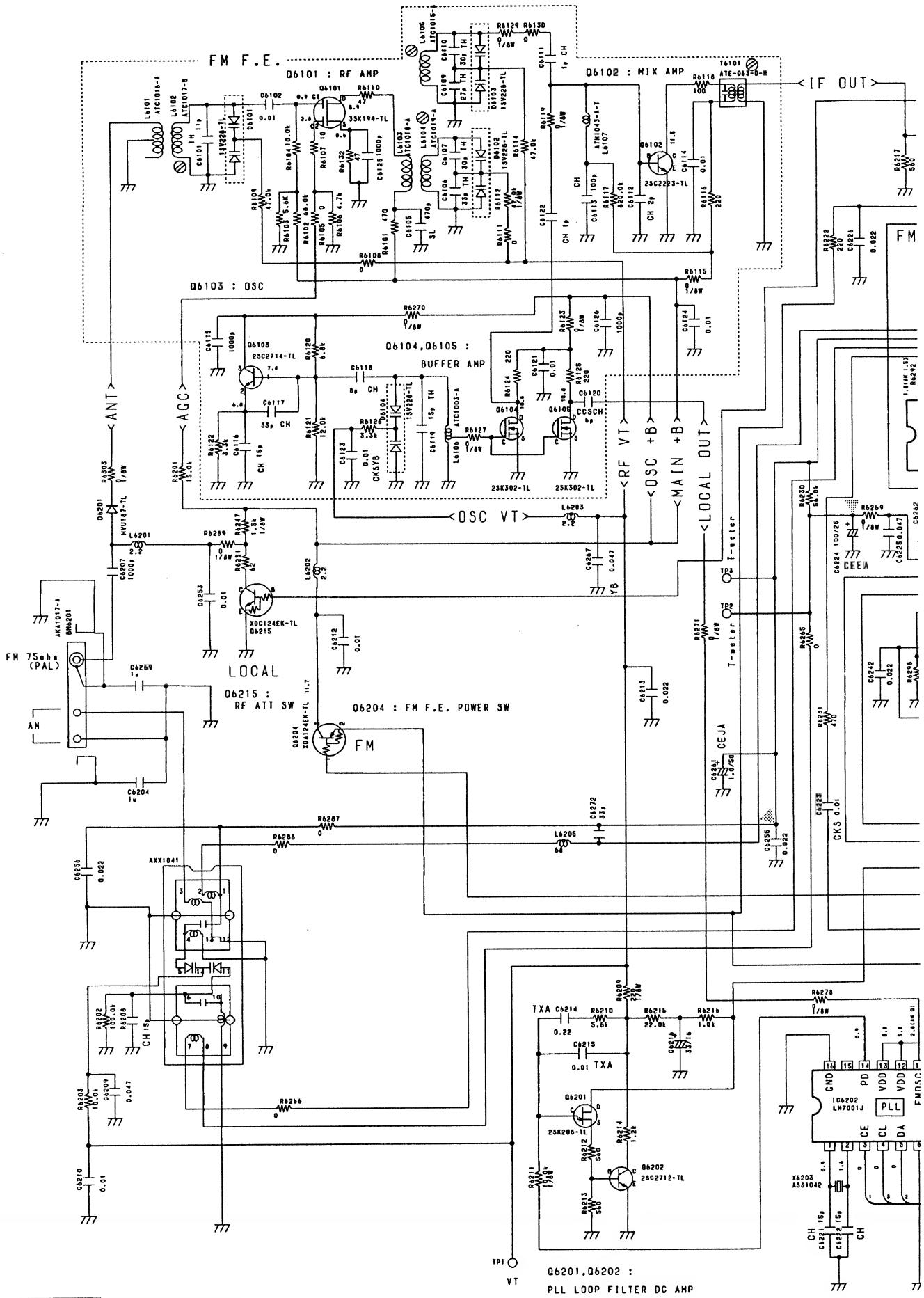
3

15

1

2

FM/AM TUNER MODULE (AXQ3226 : HEWZXK AND HEWIXK TYPES)

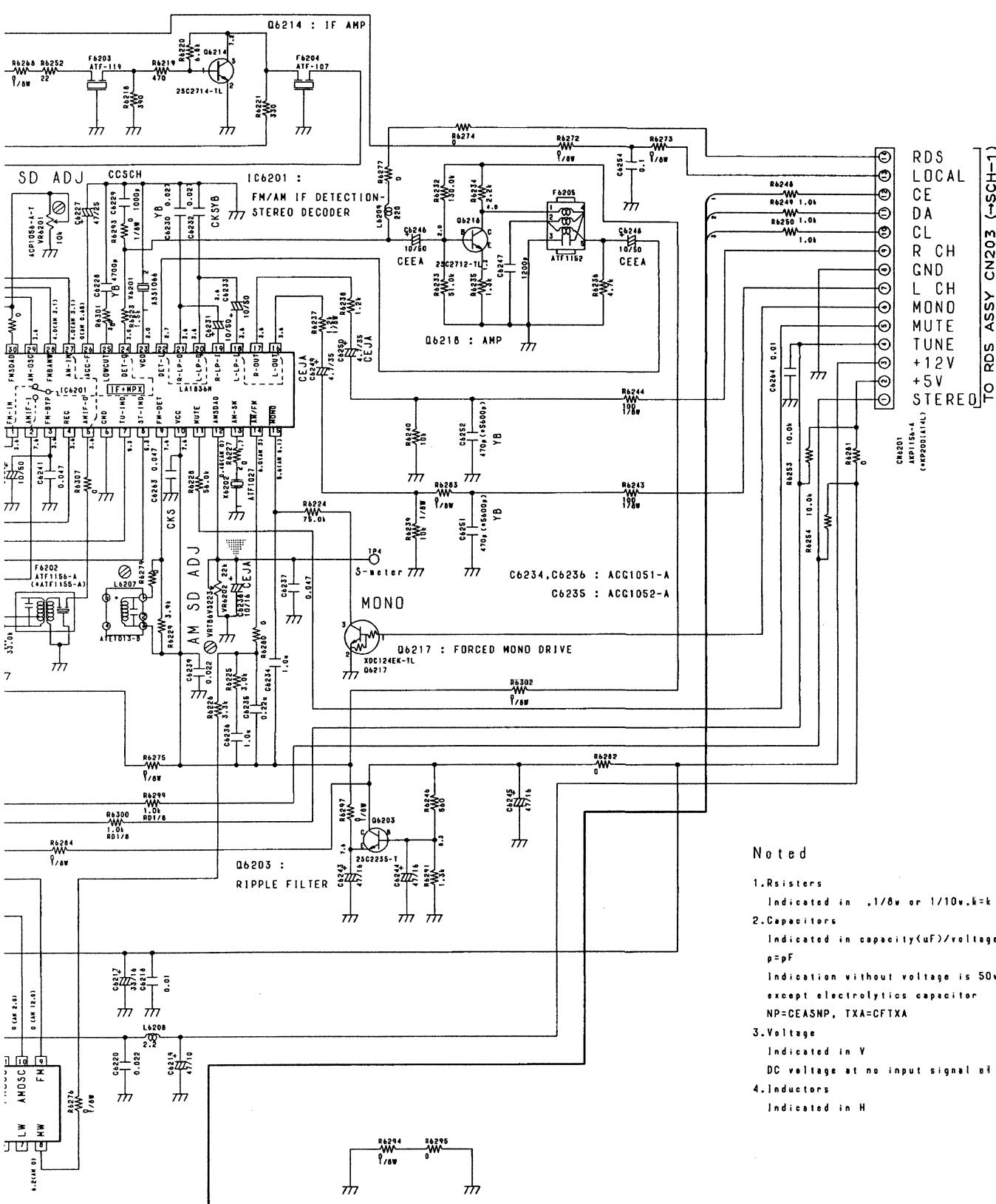


SCH-3

#### **FM/AM TUNER MODULE (FOR HEWZXK AND HEWIXK TYPES)**

SCH-3

A



## Noted

1. Resistors  
Indicated in .1/8W or 1/10W.k=k
2. Capacitors  
Indicated in capacity(uF)/voltage(V)  
p=pF  
Indication without voltage is 50V  
except electrolytic capacitor  
NP=CEASNP, TXA=CFTXA
3. Voltage  
Indicated in V  
DC voltage at no input signal of FM
4. Inductors  
Indicated in H

IC6202 : PLL IC

FM/AM TUNER MODULE  
(FOR HEWZXK AND HEWIKK TYPES)

SCH-3

B

C

D

E

F

## 4. PCB PARTS LIST (for F-204RDS/HEXX)

**NOTES:**

- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohms and 47k ohms (Tolerance is shown by J = 5%, and K = 10%).

560 Ω → 56 × 10<sup>1</sup> → 561

47k Ω → 47 × 10<sup>3</sup> → 473

0.5 Ω → 0R5

1Ω → 010

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k Ω → 562 × 10<sup>1</sup> → 5621

RD1/8PM [6][1] J

RD1/4PS [1][7][3] J

RNZH [8] R [5] K

RSP [0][1][0] K

RN1/4PC 5621 F

Mark No.	Description	Parts No.	Mark No.	Description	Parts No.	Mark No.	Description	Parts No.
<b>CONTROL ASSY'</b>				<b>CAPACITORS</b>			<b>CAPACITORS</b>	
SEMI CONDUCTORS			IC401	PDG140A	C6204, C6234, C6236 (1/16)	ACG1051		
			Q401	DTC142ES	C6254, C6269	ACG1051		
			D401 -D407	1SS252	C6229	CCSCH106DD50		
			D408 -D413	MTZ16,28	C6112	CCSCH102J50		
COILS			L402		C6118	CCSQCCH020C50		
			L401	LAU221J	C6113	CCSQCCH080D50		
			LAU2R2J		C6116	CCSQCCH101J50		
					C6203	CCSQCCH150J50		
					C6117	CCSQCCH221J50		
					C6205	CCSOSL330J50		
					C6108	CCSOSL330J50		
			S423		C6101	CCSOTH110J50		
CAPACITORS			C405	CCDSL101J50	C6109	CCSOTH150J50		
			C409	CEJA100M50	C6109	CCSOTH170J50		
			C408	CEJA221M50	C6107	CCSOTH300J50		
			C433	CKDYF223250	C6106	CCSOTH330J50		
			C414 .C421	CKPUYB101K50	C6262	CEAS100M50		
			C422 .C431	CKPUYB101K50	C6219	CEAS30M25		
			C434 .C436	CKPUYB101K50	C6233	CEAS30M50		
			C439 .C445	CKPUYB101K50	C6246	CEA870M25		
			C440 .C438	CKPUYB101K50	C6248	CEEA100N50		
			C403	CKPUYB101K50	C6224	CEEA101M25		
			C432	CKPUYB101K50	C6261	CEJA010M50		
			C406	CKPUYF73216	C6238	CEJA100M16		
RESISTORS			OT	V401 FL DISPLAY	C6249	CEJA4R7M35		
			HERS	CABLE HOLDER	C6250	CFTX103J50		
			Other Resistors	X401 CERAMIC RESONATOR (7.70MHz)	C6214	CFTX224J50		
				RD1/8PM□□□J	C6215	CKSQYB102K50		
				AAV1192	C6207	CKSQYB103K50		
				AKT1011	C6102	CKSQYB103K50		
				ASS1055	C6210	CKSQYB103K50		
					C6247	CKSQYB122K50		
					C6213	CKSQYB223K50		
					C6230	CKSQYB273K50		
					C6251	CKSQYB471K50		
					C6228	CKSQYB472K50		
					C6209	CKSQYB473K50		
					C6218	CKSQYF103Z50		
					C6212	CKSQYF223Z50		
					C6226	CKSQYF224Z50		
					C6235	CKSQYF473Z50		
					C6228	CKSQYF73250		
					C6211	CKSQYF73250		
					C6123	CKSQYF73250		
					C6223	CKSQYF73250		
					C6263	CKSYT103Z50		
					R E S I S T O R S	CKSYT124Z50		
					R6299	RD1/8PM102J		
					R6115	RD1/8PM102J		
					R6243	RD1/8PM102J		
					R6244	RD1/8PM102J		
					R6283	RD1/8PM102J		
					R6273	RD1/8PM102J		
					R6274	RD1/8PM102J		
					R6297	RD1/8PM102J		
					R6243	RD1/8PM102J		
					R6244	RD1/8PM102J		
					R6283	RD1/8PM102J		
					R6273	RD1/8PM102J		
					R6237	RD1/8PM102J		
					R6247	RD1/8PM102J		
					R6209	RD1/8PM102J		
					R6112	RD1/8PM102J		
					R6239	RD1/8PM102J		
					VR6201 (10k)	VR6202		
					Other Resistors	Other Resistors		
<b>RDS ASSY'</b>								
SEMI CONDUCTORS			IC202	NJM78M12FAS	ABA-298	O T H E R S	O T H E R S	
			IC501	PM4002B	F6204	BIN6201 2P TERMINAL WITH PAL	AKA1017	
			Q205	2SA1115	F6205	XG6203 CRYSTAL RESONATOR (7.20MHz)	ASS1042	
			Q305	2SA933S	F6206	XG6204 CRYSTAL RESONATOR (456kHz)	ASS1066	
			C202	2SC1740S	F6207	XG6205 CRYSTAL RESONATOR (456kHz)	ATH1043	
			Q201	Q208 Q301 ,Q303 ,Q304	F6208	XG6206 CERAMIC RESONATOR (450kHz)	L6207	
			Q306	2SC1740S	F6209	XG6207 CERAMIC RESONATOR (450kHz)	Q204	
			Q307	2SC1740S	F6210	XG6208 CERAMIC RESONATOR (450kHz)		
			C305	2SB5660	F6211	XG6209 CERAMIC RESONATOR (450kHz)		
			C306	2SC1740S	F6212	XG6210 CERAMIC RESONATOR (450kHz)		
			C325	CKCYX473M25	F6213	XG6211 CERAMIC RESONATOR (450kHz)		
			C309	CKCYB32K250	F6214	XG6212 CERAMIC RESONATOR (450kHz)		
			C310	CKCYB32K250	F6215	XG6213 CERAMIC RESONATOR (450kHz)		
			C311	CKCYB32K250	F6216	XG6214 CERAMIC RESONATOR (450kHz)		
			C312	CKCYB32K250	F6217	XG6215 CERAMIC RESONATOR (450kHz)		
			C307	CKCYB32K250	F6218	XG6216 CERAMIC RESONATOR (450kHz)		
			C314	CKCYB32K250	F6219	XG6217 CERAMIC RESONATOR (450kHz)		
			C318	CKCYB32K250	F6220	XG6218 CERAMIC RESONATOR (450kHz)		
			C323	CKCYB32K250	F6221	XG6219 CERAMIC RESONATOR (450kHz)		
			VR301	Other Resistors	F6222	XG6220 CERAMIC RESONATOR (450kHz)		
					F6223	XG6221 CERAMIC RESONATOR (450kHz)		
					F6224	XG6222 CERAMIC RESONATOR (450kHz)		
					F6225	XG6223 CERAMIC RESONATOR (450kHz)		
					F6226	XG6224 CERAMIC RESONATOR (450kHz)		
					F6227	XG6225 CERAMIC RESONATOR (450kHz)		
					F6228	XG6226 CERAMIC RESONATOR (450kHz)		
					F6229	XG6227 CERAMIC RESONATOR (450kHz)		
					F6230	XG6228 CERAMIC RESONATOR (450kHz)		
					F6231	XG6229 CERAMIC RESONATOR (450kHz)		
					F6232	XG6230 CERAMIC RESONATOR (450kHz)		
					F6233	XG6231 CERAMIC RESONATOR (450kHz)		
					F6234	XG6232 CERAMIC RESONATOR (450kHz)		
					F6235	XG6233 CERAMIC RESONATOR (450kHz)		
					F6236	XG6234 CERAMIC RESONATOR (450kHz)		
					F6237	XG6235 CERAMIC RESONATOR (450kHz)		
					F6238	XG6236 CERAMIC RESONATOR (450kHz)		
					F6239	XG6237 CERAMIC RESONATOR (450kHz)		
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					F6245	XG6243 CERAMIC RESONATOR (450kHz)		
					F6246	XG6244 CERAMIC RESONATOR (450kHz)		
					F6247	XG6245 CERAMIC RESONATOR (450kHz)		
					F6248	XG6246 CERAMIC RESONATOR (450kHz)		
					F6249	XG6247 CERAMIC RESONATOR (450kHz)		
					F6250	XG6248 CERAMIC RESONATOR (450kHz)		
					F6251	XG6249 CERAMIC RESONATOR (450kHz)		
					F6252	XG6250 CERAMIC RESONATOR (450kHz)		
					F6253	XG6251 CERAMIC RESONATOR (450kHz)		
					F6254	XG6252 CERAMIC RESONATOR (450kHz)		
					F6255	XG6253 CERAMIC RESONATOR (450kHz)		
					F6256	XG6254 CERAMIC RESONATOR (450kHz)		
					F6257	XG6255 CERAMIC RESONATOR (450kHz)		
					F6258	XG6256 CERAMIC RESONATOR (450kHz)		
					F6259	XG6257 CERAMIC RESONATOR (450kHz)		
					F6260	XG6258 CERAMIC RESONATOR (450kHz)		
					F6261	XG6259 CERAMIC RESONATOR (450kHz)		
					F6262	XG6260 CERAMIC RESONATOR (450kHz)		
					F6263	XG6261 CERAMIC RESONATOR (450kHz)		
					F6264	XG6262 CERAMIC RESONATOR (450kHz)		
					F6265	XG6263 CERAMIC RESONATOR (450kHz)		
					F6266	XG6264 CERAMIC RESONATOR (450kHz)		
					F6267	XG6265 CERAMIC RESONATOR (450kHz)		
					F6268	XG6266 CERAMIC RESONATOR (450kHz)		
					F6269	XG6267 CERAMIC RESONATOR (450kHz)		
					F6270	XG6268 CERAMIC RESONATOR (450kHz)		
					F6271	XG6269 CERAMIC RESONATOR (450kHz)		
					F6272	XG6270 CERAMIC RESONATOR (450kHz)		
					F6273	XG6271 CERAMIC RESONATOR (450kHz)		
					F6274	XG6272 CERAMIC RESONATOR (450kHz)		
					F6275	XG6273 CERAMIC RESONATOR (450kHz)		
					F6276	XG6274 CERAMIC RESONATOR (450kHz)		
					F6277	XG6275 CERAMIC RESONATOR (450kHz)		
					F6278	XG6276 CERAMIC RESONATOR (450kHz)		
					F6279	XG6277 CERAMIC RESONATOR (450kHz)		
					F6280	XG6278 CERAMIC RESONATOR (450kHz)		
					F6281	XG6279 CERAMIC RESONATOR (450kHz)		
					F6282	XG6280 CERAMIC RESONATOR (450kHz)		
					F6283	XG6281 CERAMIC RESONATOR (450kHz)		
					F6284	XG6282 CERAMIC RESONATOR (450kHz)		
					F6285	XG6283 CERAMIC RESONATOR (450kHz)		
					F6286	XG6284 CERAMIC RESONATOR (450kHz)		
					F6287	XG6285 CERAMIC RESONATOR (450kHz)		
				</td				

## 5. ADJUSTMENTS

### ■ AM Tuner Section

- Set the mode selector to AM BAND.
- Connect the wiring as shown in Fig. 1.

### ■ FM Tuner Section

- Set the mode selector to FM BAND.
- Connect the wiring as shown in Fig. 1.

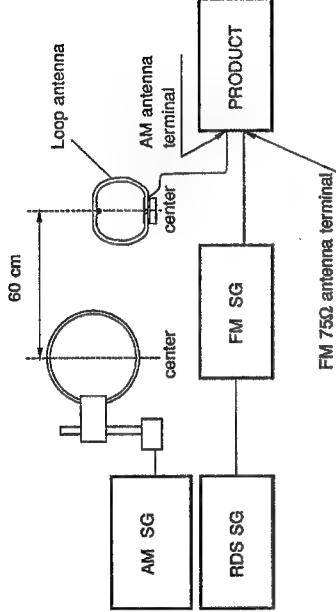


Fig. 1 FM and AM adjustment wiring diagram

Step No.	Adjustment Title	AM SG(400Hz, 30% Mod.) Frequency(KHz)	Level(dBf/V/m)	Reception Frequency Display	Adjustment Location	Specifications
1	TUNED IND. Lighting level	999	47 ± 2	999kHz	VR6202	Adjust so that the indicator of TUNED IND. starts to light up.

Step No.	Adjustment Title	FM SG(1kHz, ±75kHz dev.) Frequency(KHz)	Level(dBf/V)	Reception Frequency Display	Adjustment Location	Specifications
1	Center Adjustment	98	80 or more	98MHz	L6207	Adjust so that the DC voltage between Pin 4 and Pin 28 (or $\oplus$ leads of C6224 and C6261) of IC 6201 becomes $0V \pm 5mV$ .
2	Front End Sensitivity	98	10 – 30	98MHz	L6104 *1 L6105 L6102 T6101	Adjust so that the DC voltage between Pin 12 (or $\oplus$ lead of C6238) of IC6201 (S-meter) and GND becomes at maximum level.
3	TUNED IND. Lighting Level	98	15 ± 2	98MHz	VR6201	Adjust so that the indicator of TUNED IND. starts to light up.
4	SK Level Adjustment	88 EXTERNAL #2 (RDS SG)	60	88MHz (RF ATT ON)	VR301	Adjust so that the output level 88MHz between TP 203 and GND becomes maximum.

\*1 : HEWZKK and HEWDXK types only.

\*2 : RDS SG (AUDIO, PILOT, RDS, BK and DK : OFF, SK : ON)

#### Notes:

- Before adjusting, make sure there is no gap between L6101 and L6102. If there is a gap between them, bring them into contact with each other first, and then make adjustments.
- Make indicator adjustments in order of AM → FM.

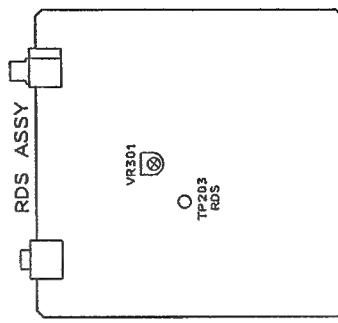
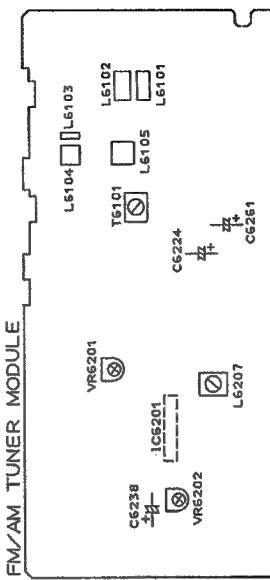


Fig. 2 Adjustment Points

## **6. FL INFORMATION**

- AAV1192

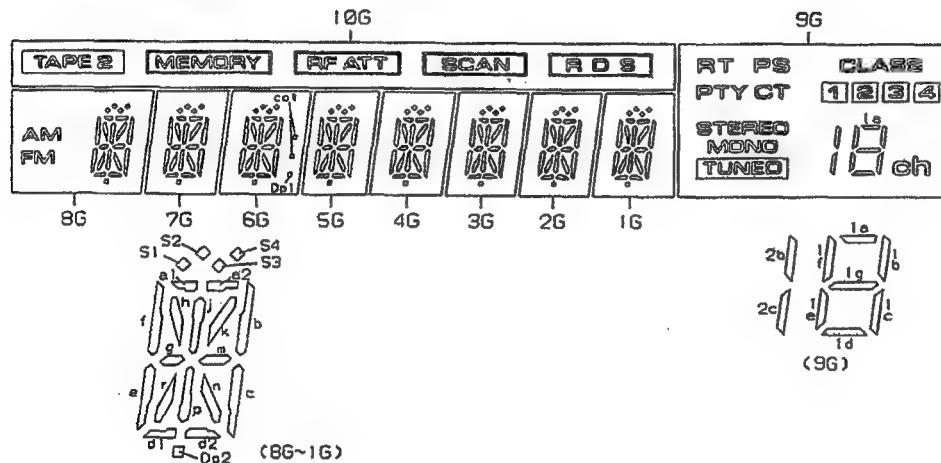
## PIN LOCATION



### PIN CONNECTION

NOTE 13 F1,F2 --- Filament  
 23 NP ----- No pin  
 33 NX ----- No extend pin  
 43 DL ----- Datum Line  
 53 1G~10G --- Grid

### GRID ASSIGNMENT



#### **ANODE CONNECTION**

ANODE CONNECTION		10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
P1	-	TUNED	S1								
P2	-	STEREO	S2								
P3	-	EQ	S4								
P4	-	EQ	S3								
PS	MEMORY	MONO	a1								
P6	ATT	4	a2								
P7	-	CLASS	h	h	h	h	h	h	h	h	h
P8	-	1	j	j	j	j	j	j	j	j	j
P9	TAPE	2b	b	b	b	b	b	b	b	b	b
P10	-	RT	k	k	k	k	k	k	k	k	k
P11	-	1a	g	g	g	g	g	g	g	g	g
P12	-	1b	f	f	f	f	f	f	f	f	f
P13	-	2c	m	m	m	m	m	m	m	m	m
P14	SCAN	CT	c	c	c	c	c	c	c	c	c
P15	-	PTY	p	p	p	p	p	p	p	p	p
P16	-	PS	r	r	r	r	r	r	r	r	r
P17	-	1g	n	n	n	n	n	n	n	n	n
P18	-	1e	d1								
P19	-	1c	e	e	e	e	e	e	e	e	e
P20	RDS	1d	d2								
P21	-	1f	Dp2								
P22	-	ch	AM	-	col	-	-	-	-	-	-
P23	-	-	FM	-	Dp1	-	-	-	-	-	-

## 7. IC INFORMATION

- The information shown in the list is basic information and may not correspond exactly to that shown in the schematic diagrams.

### ■ PDG140A (IC401) ● CONTROL MICROCOMPUTER

#### ● Pin Function

No.	NAME	I/O	FUNCTION	ACT
1	RDS DATA	I	Data from LC7073 input	—
2	REMOCON	I	REMOCON signal input	—
3	NOT USED	I	GND standard electric potential	—
4	NC	O	Not used	—
5	FM	O	FM BAND select output	H
6	RF ATT	O	RF ATT ON/OFF output	H
7	MONO	O	FM MONO output	H
8	TUNE	I	TUNE indicator signal input	L
9	STEREO	I	STEREO indicator signal input	L
10	NC	O	Not used	—
11	DIRECT	O	DIRECT ON/OFF (Receiver only) *1	H
12	LW be or not	I	L: LW not being H: LW being (Tuner only) *1	—
13	LOUDNESS	O	LOUDNESS ON/OFF (Receiver only) *1	H
14	K10	I	KEYSCAN input 0	H
15	K11	I	KEYSCAN input 1	H
16	K12	I	KEYSCAN input 2	H
17	K13	I	KEYSCAN input 3	H
18	K14	I	KEYSCAN input 4	H
19	RECEIVER/TUNER	I	Change-over of RECEIVER/TUNER (L: Tuner H: Receiver)	—
20	K15	I	KEYSCAN input 5 (Receiver only) *1	H
21	K16	I	KEYSCAN input 6 (Receiver only) *1	H
22	REMOCON be or not	I	Change-over of destination (Receiver only) *1	H
23	NC		Not used	—

No.	NAME	I/O	FUNCTION	ACT
24	FUNCTION ST	O	Change-over of FUNCTION IC (TC9164N) Strobe (Receiver only) *1	
25	MUTE	O	TUNER, MUTE control output	H
26	VOL UP	O	VOLUME UP output	H
27	VOL DOWN	O	VOLUME DOWN output	H
28	Rotary input	O	Rotary encoder input A (Tuner only) *1	H
29	Rotary input	O	Rotary encoder input B (Tuner only) *1	H
30	<u>RST</u>	I	Reset input	
31	EX' TAL		Connecting 7.7 MHz oscillation crystal between pins	—
32	X' TAL			—
33	Vss		GND standard electric potential	—
34	NC		Not used	—
35	FL AC	O	FC AC ON/OFF	L
36	POWER	O	POWER ON/OFF	H
37	Seg 17	O	Segment indication output	H
38	Seg 18	O		
39	Seg 20	O		
40	Seg 19	O		
41	Seg 1	O		
42	Seg 2	O		
43	Seg 10	O		
44	Seg 11	O		
45	Seg 3	O		
46	Seg 12	O		
47	K00/S9	O	Segment indication output / KEYSAN output	H

No.	NAME	I/O	FUNCTION	ACT
48	K01/S8	O	Segment indication output / KEYS SCAN output	H
49	K02/S13	O		
50	K03/S4	O		
51	K04/S15	O		
52	Seg 16	O		
53	Seg 14	O		
54	Seg 6	O		
55	Seg 7	O		
56	Seg 5	O		
57	Seg 21	O		
58	Seg 22	O	Segment indication output	H
59	Seg 23	O		
60	Seg 24	O		
61	R: G 1 T: G 10	O		
62	R: G 2 T: G 9	O		
63	R: G 3 T: G 8	O		
64	R: G 4 T: G 7	O		
65	R: G 5 T: G 6	O		
66	R: G 6 T: G 1	O		
67	R: G 7 T: G 2	O		
68	R: G 8 T: G 3	O	Grid FL indication output	H
69	R: G 9 T: G 4	O		
70	R: G 10 T: G 5	O		

No.	NAME	I/O	FUNCTION	ACT
71	-VFDP	/	Electric potential for EDP (-30 V)	—
72	VDD	/	+5 V Power source input	—
73	NC	/	+5 V Power source input	—
74	TEST	I	TEST MODE judgement input	H
75	PLL_DT	O	PLL communication data output (LM7001) and change-over function (TC9164N)	—
76	PLL_CK	O	PLL communication clock output (LM7001) and change-over function (TC9164N)	—
77	PLL_CE	O	PLL communication chip unable output (LM7001)	H
78	RDS_CK	I	Each bit from LC7073 synchronizing clock input	—
79	AC	I	WAKE + UP AC pulse input	—
80	RDS_OUT	I	Judging RDS signals output or not	L

\*1 : Functions will be changed according to setting (L or H) of Pin 19.

## 8. FOR HBWXK, HEWZXK AND HEWIXK TYPES

### NOTES:

- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohms and 47k ohms (Tolerance is shown by J = 5%, and K = 10%).

560 Ω → 56 × 10 <sup>1</sup> → 561	RD1/8PM 5 6 1 J
47k Ω → 47 × 10 <sup>3</sup> → 473	RD1/4PS 4 7 3 J
0.5 Ω → 0R5	RN2H 0 R 5 K
1 Ω → 010	RS1P 0 1 0 K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k Ω → 562 × 10 <sup>1</sup> → 5621	RN1/4PC 5 6 2 1 F
--	-------------------

HBWXK, HEWZXK, HEWIXK and HEXK have the same construction except for the following:

Mark	Symbol & Description	Part No.				Remarks
		HEXK	HBWXK	HEWZXK	HEWIXK	
NSP	TUNER ASSY	AWE7009	AWE7009	AWE7010	AWE7011	
	POWER ASSY	AWZ7709	AWZ7709	AWZ7710	AWZ7710	
	RDS ASSY	AWZ7711	AWZ7711	AWZ7712	AWZ7713	
	CONTROL ASSY	AWZ7714	AWZ7714	AWZ7715	AWZ7715	
	FM/AM TUNER MODUL	AXQ7040	AXQ7040	AXQ3226	AXQ3226	
	C2 Ceramic capacitor	CKDYB102K50	CKDYB102K50	Not used	Not used	
	AC power cord	ADG1138	ADG1148	ADG1138	ADG1138	
	Fuse (5A/250V)	Not used	AEK1046	Not used	Not used	
	Operating instructions (English, French, German, Swedish, Italian, Dutch, Spanish, Portuguese)	ARE7031	Not used	Not used	Not used	
	Operating instructions (English)	Not used	ARB7032	Not used	Not used	
	Operating instructions (German)	Not used	Not used	ARC7051	Not used	
	Operating instructions (Italian)	Not used	Not used	Not used	ARC7052	
	Air cap	Not used	AHG1203	Not used	Not used	
	Packing case	AHD7133	AHD7134	AHD7133	AHD7133	

### ● POWER ASSY

Although AWZ7715 and AWZ7714 are different in part number, they have the same service parts.

### ● RDS ASSY

AWZ7712, AWZ7713 and AWZ7711 have the same construction except for the following:

Mark	Symbol & Description	Part No.			Remarks
		AWZ7711	AWZ7712	AWZ7713	
	L303 R305, R306	LAU010J RD1/8PM332J	LAU2R2J Not used	LAU2R2J RD1/8PM332J	

### ● CONTROL ASSY

AWZ7715 and AWZ7714 have the same construction except for the following:

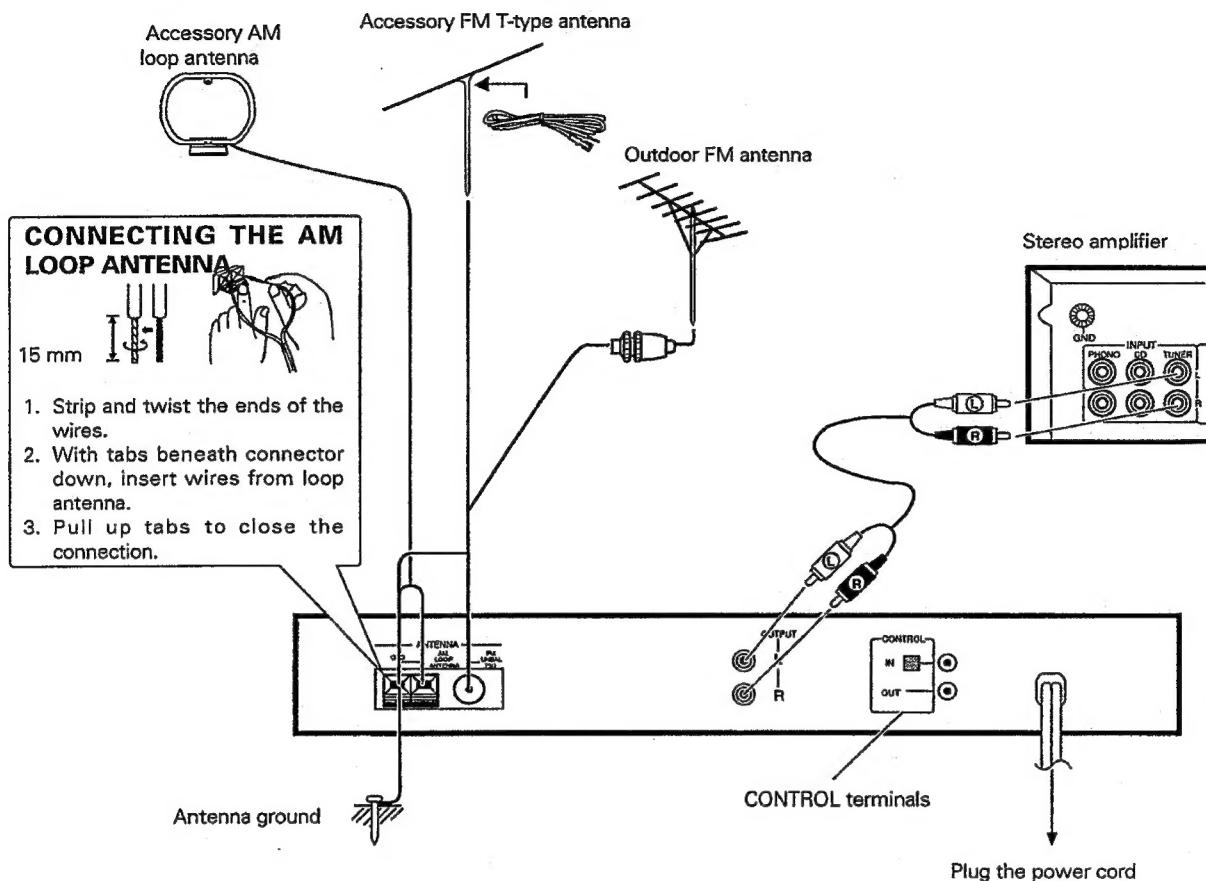
Mark	Symbol & Description	Part No.		Remarks
		AWZ7714	AWZ7715	
	R419 R420	RD1/8PM473J RD1/8PM222J	RD1/8PM104J Not used	

### ● FM/AM TUNER MODUL

AXQ3226 and AXQ7040 have the same construction except for the following:

Mark	Symbol & Description	Part No.		Remarks
		AXQ7040	AXQ3226	
	Q6205, Q6206 Q6207 - Q6209, Q6210, Q6216 D6202 C6115 C6126  C6203 C6211 C6216, C6217 C6219 C6231, C6233  C6243 - C6245 C6256 R6204 - R6206 R6207, R6208 R6263  R6264, R6285, R6286, R6310 R6276 R6288 AM RF tuning block	XDA124EK XDC124EK ISS184 CKSQYB103K50 Not used  CCSQCH221J50 CKSQYF473Z50 CEAS330M25 CEAS470M25 CEAS3R3M50  CEAS470M25 Not used RS1/10S103J RS1/10S102J RS1/8S000J  RS1/10S000J Not used Not used AXX1042	Not used Not used Not used CKSQYB102K50 CKSQYB102K50  Not used Not used CEAS330M16 CEAS470M10 CEAS100M50  CEAS470M16 CKSQYF223Z50 Not used Not used Not used  Not used RS1/8S000J RS1/10S000J AXX1041	

## 9. CONNECTIONS



### Antenna ground

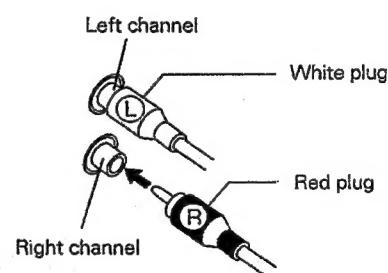
Although grounding is not always necessary for reception, it is recommended for protection against damage from lightning if an outdoor FM antenna is used. It is also recommended for reducing noise and hum.

### CAUTION:

Never make the ground connection to a gas pipe as sparks can cause the gas to ignite.

### Pin plug connecting cord

- Connect the white plug to the white terminal (L) and the red plug to the red terminal (R).
- Make sure that the connections are secure.

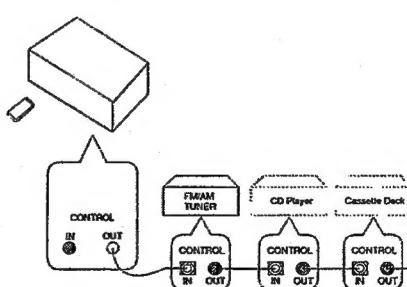


### CONTROL Terminals

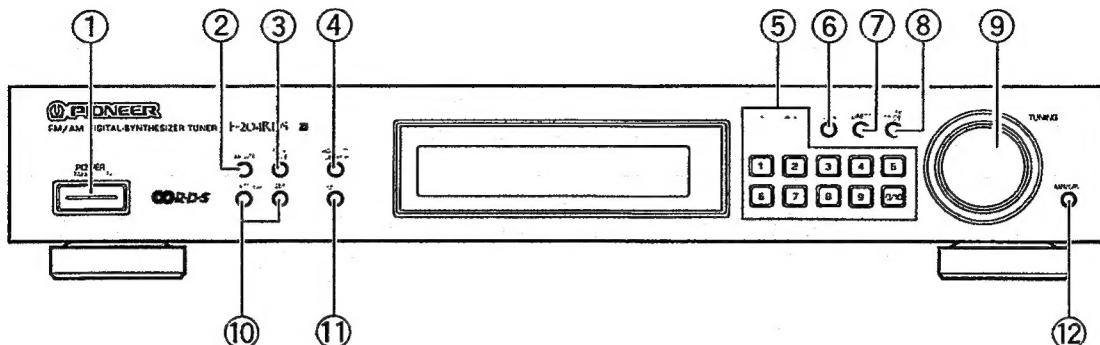
When using together with a Pioneer component bearing the  mark, connect the CONTROL IN terminal on the rear panel of the tuner to the CONTROL OUT terminal on the component using the supplied control cord. This will enable the tuner to be controlled from a distance with the remote control unit supplied with the component.

When this feature is not used, connection is not necessary.

- For instructions regarding connection and operation, please refer to the operating instruction manual of your stereo component.



## 10. FRONT PANEL FACILITIES



### ① POWER (STANDBY/ON) switch

This is the switch for electric power.

**ON** ..... When set to ON position, power is supplied and the unit becomes operational.

**STANDBY** ..... When set to STANDBY position, the main power flow is cut and the unit is no longer fully operational. A minute flow of power feeds the unit to maintain operation readiness.

**NOTE:**

- The memory will be backed up so long as the power cord is unplugged.
- If the power cord is unplugged, the memory will be retained for several days.
- When not using the unit for a long period, disconnect the power cord.

### ② RF ATT button

Set this button to on when receiving strong FM signals (nearby stations) to reduce sound distortion (RF ATT indicator lights). Normally, this button should be set to off.

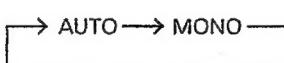
This button does not affect AM reception.

**NOTE:**

This button's status is preset for each station in station memory.

### ③ MPX (multiplex) MODE button

Mode changes as follows each time this button is pressed



This button does not affect AM reception.

**AUTO:**

"AUTO" is not displayed.

Normally leave in this mode for reception. When a stereo FM broadcast is received, it will be automatically reproduced in stereo sound and the STEREO indicator lights up.

**NOTE:**

When the signal level is too weak for reception, sound output is automatically muted.

**MONO:**

MONO indicator lights up.

To receive stereo broadcasts in monaural.

If there is too much noise during stereo reception of a weak signal, you can reduce the level of noise by switching to MONO.

**NOTE:**

This button's status is preset for each station in station memory.

### ④ CHARACTER/SEARCH button

When receiving an AM broadcast, or when in the FM RT or PS mode:

Press this button, "INPUT" is displayed, and the mode switches to manual station name input.

**When in the FM PTY mode:**

Press this button, "SEARCH" is displayed, and the mode switches to program type search.

### ⑤ STATION CALL buttons

Use these buttons to preset stations and to receive the already preset stations.

These are also used when performing direct access tuning.

### ⑥ CLASS button

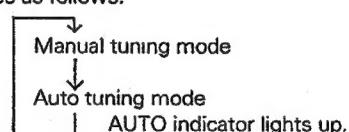
Use to switch between preset memory classes 1 to 3. In each class, 10 stations can be memorized using the STATION CALL buttons, enabling a total of 30 stations to be memorized.

### ⑦ DIRECT button

When this button is pressed, the STATION CALL buttons function as ten-key number buttons for direct input of the desired reception frequency. Press again to cancel this mode.

### ⑧ TUNING MODE button

Each time you press this button, the TUNING knob's function changes as follows.



● Auto Tuning is not possible on the LW band.

### ⑨ TUNING knob

Use for tuning. To raise the frequency, turn in a clockwise direction; to lower the frequency, turn counterclockwise.

**AM:** For MW, frequency changes in 9 kHz steps.

For LW, frequency changes in 1 kHz steps.

**FM:** Frequency changes in 50kHz steps.

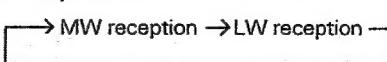
In the Station Name input mode, PTY Search mode, the TUNING knob is used to select characters and program types.

### ⑩ BAND selector buttons

These buttons are used to select either FM or AM reception.

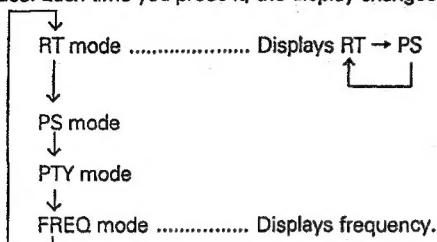
**FM:** Press to receive FM broadcasts.

**AM:** The bands change alternately as follows, each time this button is pressed.

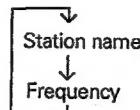


**⑪ DISPLAY MODE button**

Use only during FM reception. Use this to switch between display modes. Each time you press it, the display changes as follows.



When receiving AM, valid only when the station name is memorized.

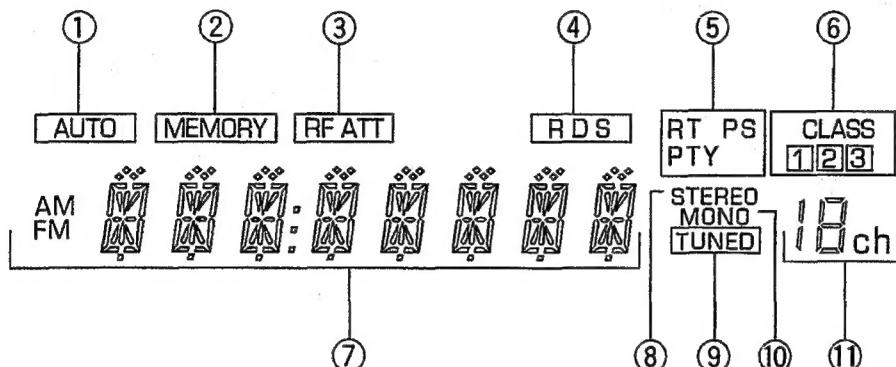


Does not show other displays. When no station name is memorized, the DISPLAY MODE button becomes invalid.

**⑫ MEMORY button**

Use to preset stations.

This is also used for FM or AM broadcast manual station name character selection.

**● DISPLAY****① AUTO indicator**

Lights during auto tuning mode.

**② MEMORY indicator****③ RF ATT indicator**

Stays lit while RF ATT button is on.

**④ RDS indicator**

Lights when an RDS broadcast is received.

**⑤ RT, PS, PTY indicator**

One of these lights to indicate the selected display mode (selected by the DISPLAY MODE button).

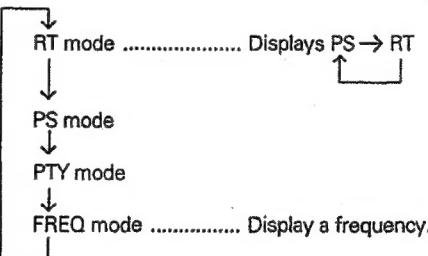
**⑥ CLASS [1, 2, 3] indicator**

Shows the class selected by the CLASS button.  
The current CLASS is displayed.

**⑦ Frequency and character display section**

Band and frequency data is displayed.

During FM reception, the display changes as follows each time the DISPLAY MODE button is pressed.

**⑧ STEREO indicator**

Lights up when a stereo broadcast is received (the indicator does not light when the MPX MODE button is set to MONO).

**⑨ TUNED indicator**

Lights when a broadcast is received.

**⑩ MONO indicator**

Stays lit while MPX MODE button is set to MONO.

**⑪ Station display section**

When STATION CALL buttons are pressed, it will show the corresponding station number.

## 11. SPECIFICATIONS

### FM Tuner Section

Frequency Range .....	87.5 MHz to 108 MHz
Usable Sensitivity	
NORMAL .....	Mono: 12.7 dBf, IHF(1.2 $\mu$ V/75 $\Omega$ )
50 dB Quieting Sensitivity	
NORMAL .....	Mono: 18.0 dBf, IHF (2.2 $\mu$ V/75 $\Omega$ ) Stereo: 38.3 dBf, IHF (22.6 $\mu$ V/75 $\Omega$ )
Sensitivity (DIN)	
NORMAL .....	Mono: 1.0 $\mu$ V/75 $\Omega$ Stereo: 50 $\mu$ V/75 $\Omega$
Signal-to-Noise Ratio .....	Mono: 76 dB (at 80 dBf) Stereo: 72 dB (at 80 dBf)
Signal-to-Noise Ratio (DIN)	
..... Mono: 62 dB ..... Stereo: 58 dB	
Distortion (at 80 dBf)	
NARROW .....	Mono: 0.5 % (1 kHz) Stereo: 0.6 % (1 kHz)
Alternate Channel Selectivity .....	70 dB (400 kHz)
Stereo Separation .....	40 dB (1 kHz)
Frequency Response .....	$\pm$ 1 dB (30 Hz to 15 kHz)
Image Response Ratio .....	80 dB
IF Response Ratio .....	90 dB
Antenna Input .....	75 $\Omega$ unbalanced

### AM (MW) Tuner Section

Frequency Range .....	531 kHz to 1,602 kHz (Step 9 kHz)
Sensitivity (IHF, Loop antenna) .....	350 $\mu$ V/m
Selectivity .....	30 dB
Signal-to-Noise Ratio .....	50 dB
Image Response Ratio .....	40 dB
IF Response Ratio .....	50 dB
Antenna .....	Loop Antenna

### AM (LW) Tuner Section

Frequency Range .....	153 kHz to 281 kHz
Sensitivity (IHF, Loop antenna) .....	1,000 $\mu$ V/m
Selectivity .....	30 dB
Signal-to-Noise Ratio .....	50 dB
Image Response Ratio .....	40 dB
IF Response Ratio .....	50 dB
Antenna .....	Loop Antenna

### Audio Section

Output (Level/Impedance)	
FM (100 % MOD) .....	650 mV/2.5 k $\Omega$
AM (30 % MOD) .....	150 mV/2.5k $\Omega$

### Miscellaneous

Power Requirements .....	AC 230 Volts~, 50/60 Hz
Power Consumption .....	15 W
Dimensions .....	420 (W) x 75 (H) x 292.9 (D) mm
Weight (without package) .....	2.7 kg

### Furnished Parts

FM T-type Antenna .....	1
AM Loop Antenna .....	1
Connecting Cord with Pin Plugs .....	1
Control Cord .....	1
Operating Instructions .....	1

### NOTE:

Specifications and design are subject to possible modifications without notice, due to improvements.